AIR QUALITY ASSESSMENT

Borrego 1 Solar Project
MUP 3300-10-026
Environmental Review Number 10-050-01
APN 140-290-12

Prepared for the:

County of San Diego
Department of Planning and Land Use
Contact: Mark Slovick
5201 Ruffin Road, Suite B
San Diego, CA 92123
858-495-5172

Prepared By:

Jeremy Louden
Ldn Consulting, Inc.
446 Crestcourt Lane
Fallbrook, California 92028
760-473-1253

Project Proponent:

NRG Solar Borrego I LLC
1015 West Hays
Boise, ID 83702

March 21, 2011

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDIX

LIST OF ACRONYMS

Photovoltaic (PV)
Mega Watt (MW)
Cubic Yards (CY)
Diesel Particulate Matter (DPM)
Miles Per Hour (MPH)
Decomposed Granite (d.g.)
San Diego Gas and Electric (SDG&E)
San Diego Air Basin (SDAB)
National Ambient Air Quality Standards (NAAQS)
California Ambient Air Quality Standards (CAAQS)
Office of Air Quality Planning and Standards (OAQPS)
Carbon Monoxide (CO)
Lead (Pb)
Nitrogen Dioxide (NO_2)
Particulate Matter (PM_{10} or $PM_{2.5}$)
Ozone (O_3)
Sulfur Dioxide (SO_2)
Salton Sea Air Basin (SSAB)
Hydrogen Sulfide (H_2S):
San Diego Air Pollution Control District (SDAPCD)
Regional Air Quality Strategy (RAQS)
Air Quality Impact Assessments (AQIA)
Volatile Organic Compounds (VOCs)
Toxic Air Contaminants (TACs)
Best Available Control Technology (T-BACT)
Polyvinyl Chloride (PVC)
Cubic Yard (CY)

EXECUTIVE SUMMARY

This air quality analysis has been completed to determine impacts, which may be associated with the construction and operation of the proposed Borrego 1 Solar Project. The Project would consist of clearing the entire 308 acres and then installing solar panels – no mass grading will be required. Additionally, all the generation facilities and transmission upgrades would be part of the proposed project. The Project is located in the unincorporated community of Borrego Springs in eastern portion of San Diego County, CA. All phases of the proposed project are anticipated to be completed by the summer of 2012.

During construction, the proposed project will produce fugitive dust and diesel particulate matter, Reactive Organic Gases, Oxides of Nitrogen, Carbon Monoxide and Sulfur Dioxide, however, only construction related PM10 without mitigation would be expected to exceed PM10 thresholds established by the County of San Diego. Implementation of mitigation activities described below will reduce construction emissions to below significance:

1. *Apply water during grading/grubbing activities to all active disturbed areas at least twice daily.*
2. *Apply water to all onsite roadways at least three times daily or use of magnesium chloride or other County approved dust suppression additives and apply water one-time daily.*
3. *Reduce all construction related traffic speeds onsite to below 15 Miles per Hour (MPH).*

A screening-level health risk assessment was conducted to determine the potential for the project to result in a significant impact on nearby sensitive receptors during short-term construction activities. For purposes of this analysis, the primary pollutant of concern is diesel particulate matter (DPM) which is emitted by the operation of heavy diesel equipment during construction activities. The result of the health risk assessment indicates that the proposed project will not result in a significant impact to nearby sensitive receptors.

Emissions from daily operations of the project will be primarily from maintenance and worker trips only; they would be minimal and would be below the screening

level thresholds within the San Diego County Guidelines for Determining Significance.

Fugitive dust emissions from the project site during operations could have a potentially significant impact on PM10 concentrations in the area. In order to mitigate for fugitive dust caused from operation of the site a permeable soil-binding or permeable rock material shall be used to limit the dust. A non-toxic, biodegradable permeable soil-binding agent or permeable rock material will be applied to all disturbed or exposed surface areas as follows:

a. A permeable soil-binding agent suitable for both traffic and non-traffic areas shall be used. These agent shall be are biodegradable, eco-safe, with liquid copolymers that stabilize and solidify soils or aggregates, which and facilitate dust suppression.

b. Alternatively, a permeable rock material consisting of either river stone decomposed granite or gravel could be placed in a thin cover over all exposed surface area in-lieu of the binding agent referenced above.

c. In-lieu of, or in combination with #1 and #2 above, the areas located between the arrays, and any non-drivable surface may be revegetated with native noninvasive plant species. A Revegetation Plan, shall be prepared, that which provides sufficient ground cover to mitigate fugitive dust from the ground disturbances. The revegetation plan shall conform to the most current version of the County of San Diego Report Format and Content Requirements for Revegetation Plans.

1.0 INTRODUCTION

The purpose of this Air Quality study is to determine potential air quality impacts (if any) that may be created during the construction of the proposed Borrego 1 Solar Project. The Project is located at 33° 17' 31" N and 116° 21' 12" W, at the southwest corner of Henderson Canyon Road and Borrego Valley Road in the Borrego Springs Community located within the County of San Diego. The general location of the Project is shown on the Vicinity Map, Figure 1-A.

1.1 Project Description

The Project will generate approximately 26 MWac (31 MWdc) of power and the PV panels will be mounted either on fixed tilt supports or single-axis trackers.

The main project access will be located at the southeast corner of the site on Borrego Valley Road with a secondary access on Henderson Canyon Road. No sewer service or potable water is required as the facility would be unmanned. Water would be used for dust suppression during construction and the Project would use approximately two acre-feet of water annually during operation for cleaning the solar panels. This water will be provided from an existing well on the property or from the water district and will be trucked to the site when needed.

The site would be grubbed to remove existing vegetation and almost no grading would be necessary as it is already level. The soil surface will be smoothed and compacted to prepare the site for installation of the solar panels. The construction period for the Project is expected to be a 4-6 month timeframe.

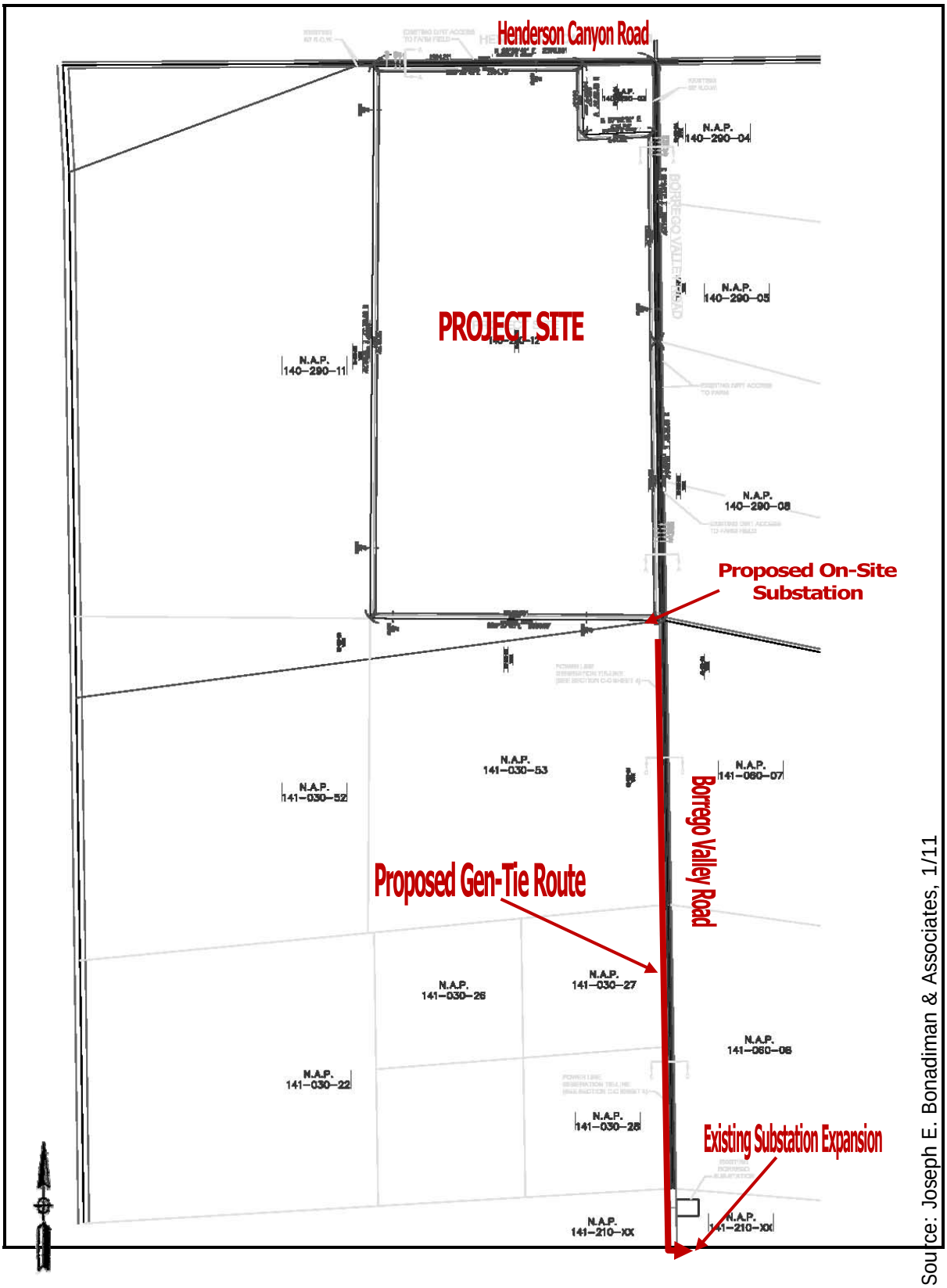
The only off-site improvement associated with the Project is a 69kV generation-tie (gen-tie) transmission line from the site to SDG&E's existing Borrego Substation. The proposed gen-tie line is approximately one mile in length and would be located within the disturbed right-of-way on the west side of Borrego Valley Road. The interconnection at the existing substation would occur within its existing property.

The general project layout, existing SDG&E substation location and proposed Gen-Tie line route can be seen in Figure 1-B. The site plans for the two potential configurations used for this analysis are shown in Figure 1-C and Figure 1-D below.

Figure 1-A: Project Vicinity Map

Source: Google Maps, 11/10

Figure 1-B: Project Site and Existing SDG&E Substation Layout



Source: Joseph E. Bonadiman & Associates, 1/11

Figure 1-C: Project Site Plan (Fixed Array)

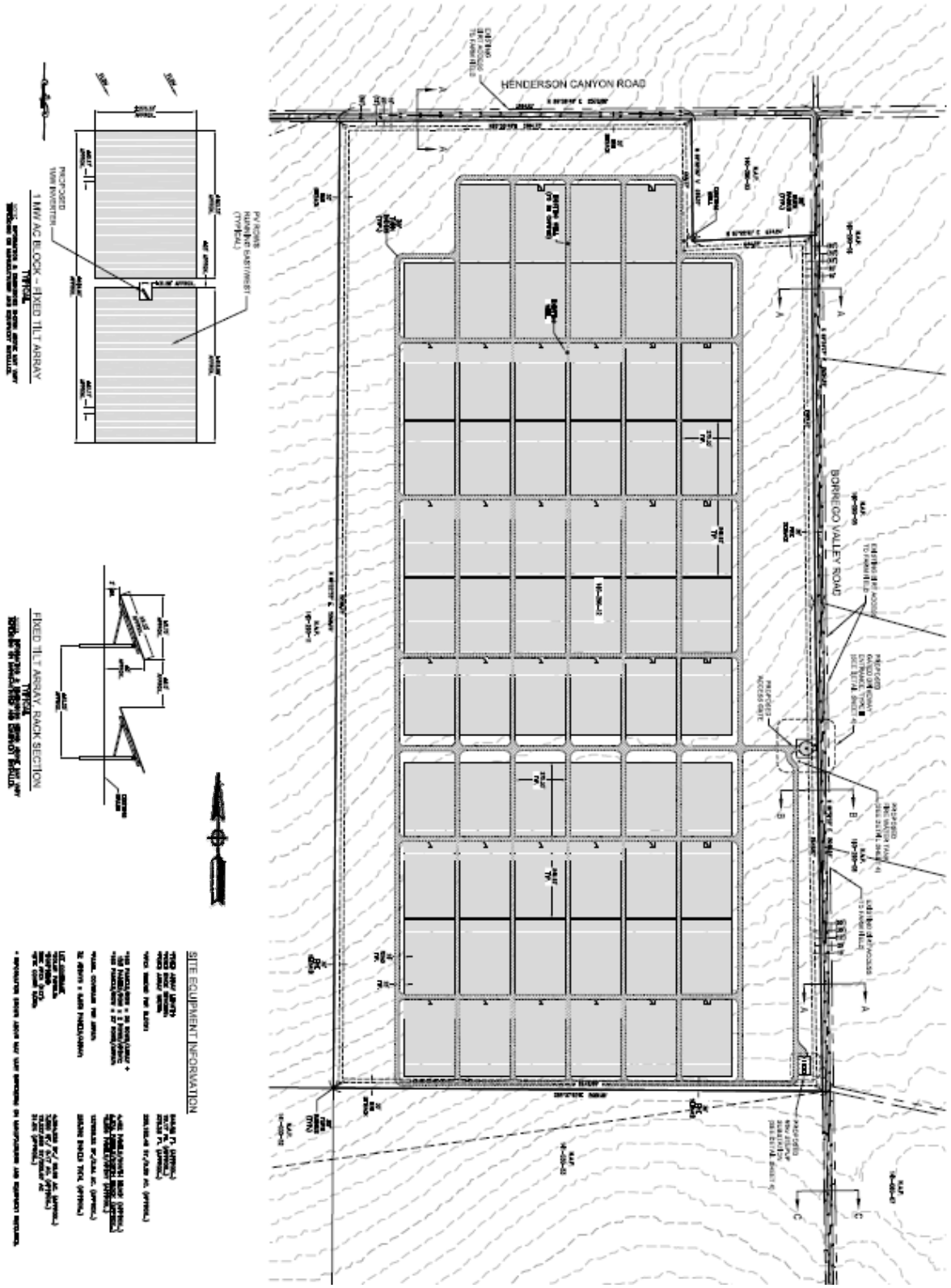
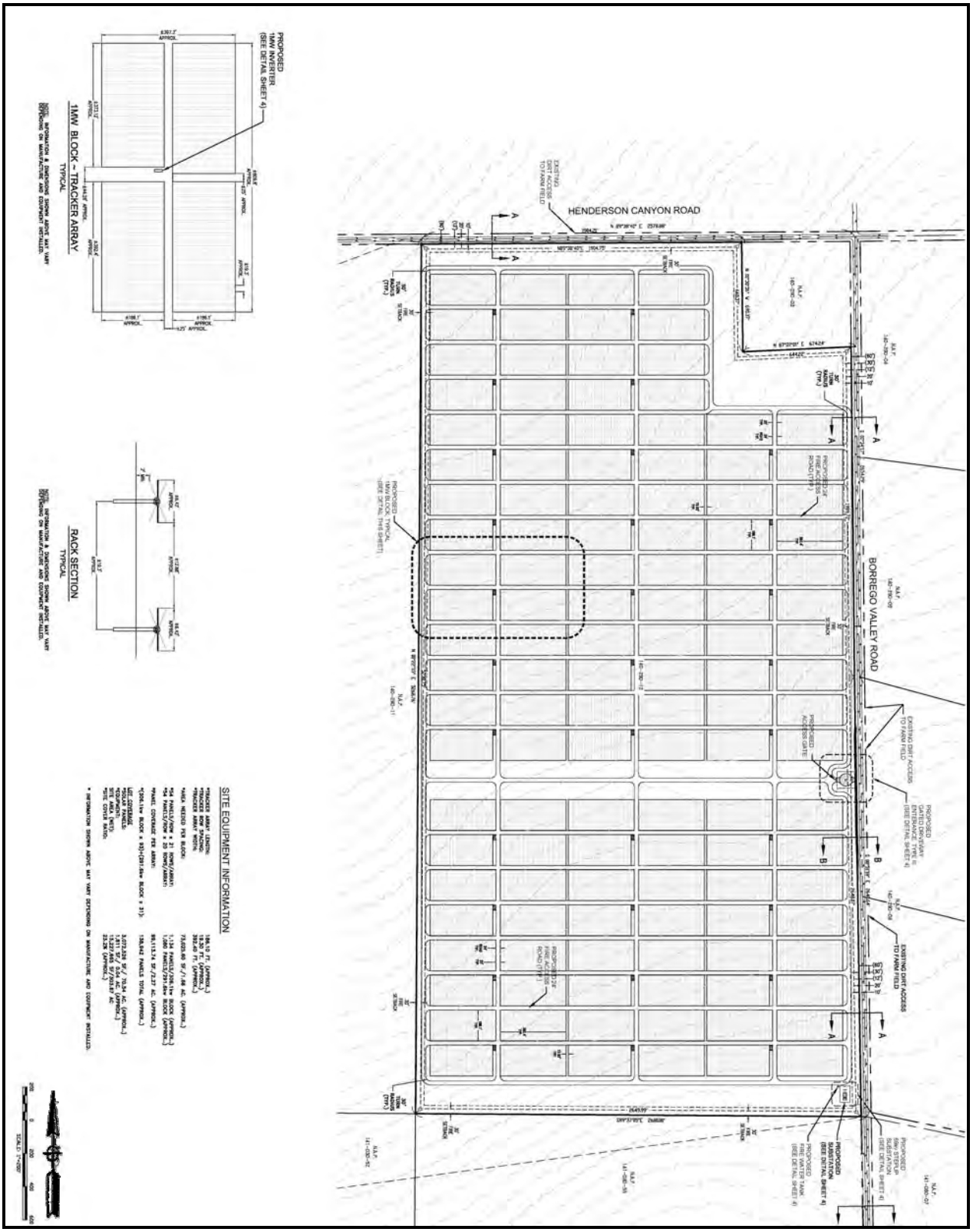


Figure 1-D: Project Site Plan (Tracker Array)



2.0 EXISTING ENVIRONMENTAL SETTING

2.1 Existing Setting

The project site is comprised of vacant land with vegetation. No existing developments were noted during our site visit.

2.2 Climate and Meteorology

Climate within the San Diego Air Basin (SDAB) area often varies dramatically over short geographical distances due to the size and topography. Most of southern California is dominated by high-pressure systems for much of the year, which keeps the desert mostly sunny and warm. Typically, during the winter months, the high pressure system drops to the south and brings cooler, moister weather from the north.

It is common for inversion layers to develop within high-pressure areas, which mostly define pressure patterns over the SDAB. These inversions are caused when a thin layer of the atmosphere increases in temperature with height. An inversion acts like a lid preventing vertical mixing of air through convective overturning.

2.3 Regulatory Standards

2.3.1 Federal Standards and Definitions

The Federal Air Quality Standards were developed per the requirements of The Federal Clean Air Act, which is a federal law that was passed in 1970 and amended in 1990. This law provides the basis for the national air pollution control effort. An important element of the act included the development of national ambient air quality standards (NAAQS) for major air pollutants.

The Clean Air Act established two types of air quality standards otherwise known as primary and secondary standards. ***Primary Standards*** set limits for the intention of protecting public health, which includes sensitive populations such as asthmatics, children and elderly. ***Secondary Standards*** set limits to protect public welfare to include protection against decreased visibility, damage to animals, crops, vegetation and buildings.

The Environmental Protection Agency (EPA) Office of Air Quality Planning and Standards (OAQPS) has set National Ambient Air Quality Standards for principal pollutants, which are called "criteria" pollutants. These pollutants are defined below:

1. ***Carbon Monoxide (CO):*** *is a colorless, odorless, and tasteless gas and is produced from the partial combustion of carbon-containing compounds, notably in internal-combustion engines. CO usually forms when there is a reduced availability of oxygen present during the combustion process. Exposure to CO near the levels of the ambient air quality standards can lead to fatigue, headaches, confusion, and dizziness. CO interferes with the blood's ability to carry oxygen.*
2. ***Lead (Pb):*** *is a potent neurotoxin that accumulates in soft tissues and bone over time. The major sources of lead emissions have historically been motor vehicles (such as cars and trucks) and industrial sources. Because lead is only slowly excreted, exposures to small amounts of lead from a variety of sources can accumulate to harmful levels. Effects from inhalation of lead near the level of the ambient air quality standard include impaired blood formation and nerve conduction. Lead can adversely affect the nervous, reproductive, digestive, immune, and blood-forming systems. Symptoms can include fatigue, anxiety, short-term memory loss, depression, weakness in the extremities, and learning disabilities in children.*
3. ***Nitrogen Dioxide (NO_2):*** *is a reactive, oxidizing gas capable of damaging cells lining the respiratory tract and is one of the nitrogen oxides emitted from high-temperature combustion, such as those occurring in trucks, cars, power plants, home heaters, and gas stoves. In the presence of other air contaminants, NO_2 is usually visible as a reddish-brown air layer over urban areas. NO_2 along with other traffic-related pollutants is associated with respiratory symptoms, respiratory illness and respiratory impairment. Studies in animals have reported biochemical, structural, and cellular changes in the lung when exposed to NO_2 above the level of the current state air quality standard. Clinical studies of human subjects suggest that NO_2 exposure to levels near the current standard may worsen the effect of allergens in allergic asthmatics, especially in children.*
4. ***Particulate Matter (PM_{10} or $PM_{2.5}$):*** *is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary in shape, size and chemical composition, and can be made up of multiple materials such as metal, soot, soil, and dust. PM_{10} particles are 10 microns (µm) or less and $PM_{2.5}$ particles are 2.5 (µm) or less. These particles can contribute significantly to regional haze and reduction of visibility in California. Exposure to PM levels exceeding current air quality standards increases the risk of allergies such as asthma and respiratory illness.*
5. ***Ozone (O_3)****: is a highly oxidative unstable gas capable of damaging the linings of the respiratory tract. This pollutant forms in the atmosphere through reactions between chemicals*

directly emitted from vehicles, industrial plants, and many other sources. Exposure to ozone above ambient air quality standards can lead to human health effects such as lung inflammation, tissue damage and impaired lung functioning. Ozone can also damage materials such as rubber, fabrics and plastics.

6. ***Sulfur Dioxide (SO_2)**: is a gaseous compound of sulfur and oxygen and is formed when sulfur-containing fuel is burned by mobile sources, such as locomotives, ships, and off-road diesel equipment. SO_2 is also emitted from several industrial processes, such as petroleum refining and metal processing. Effects from SO_2 exposures at levels near the one-hour standard include bronchoconstriction accompanied by symptoms, which may include wheezing, shortness of breath and chest tightness, especially during exercise or physical activity. Children, the elderly, and people with asthma, cardiovascular disease or chronic lung disease (such as bronchitis or emphysema) are most susceptible to these symptoms. Continued exposure at elevated levels of SO_2 results in increased incidence of pulmonary symptoms and disease, decreased pulmonary function, and increased risk of mortality.*

2.3.2 State Standards and Definitions

The State of California Air Resources Board (ARB) sets the laws and regulations for air quality on the state level. The California Ambient Air Quality Standards (CAAQS) are either the same as or more restrictive then the NAAQS and also restrict four additional contaminants. Table 2.1 on the following page identifies both the NAAQS and CAAQS. The additional contaminants as regulated by the CAAQS are defined below:

1. ***Visibility Reducing Particles**: particles in the air that obstruct visibility.*
2. ***Sulfates**: are salts of Sulfuric Acid. Sulfates occur as microscopic particles (aerosols) resulting from fossil fuel and biomass combustion. They increase the acidity of the atmosphere and form acid rain.*
3. ***Hydrogen Sulfide (H_2S)**: is a colorless, toxic and flammable gas with a recognizable smell of rotten eggs or flatulence. H_2S occurs naturally in crude petroleum, natural gas, volcanic gases, and hot springs. Usually, H_2S is formed from bacterial breakdown of organic matter. Exposure to low concentrations of hydrogen sulfide may cause irritation to the eyes, nose, or throat. It may also cause difficulty in breathing for some asthmatics. Brief exposures to high concentrations of hydrogen sulfide (greater than 500 ppm) can cause a loss of consciousness and possibly death.*
4. ***Vinyl Chloride**: is also known as chloroethene and is a toxic, carcinogenic, colorless gas with a sweet odor. It is an industrial chemical mainly used to produce its polymer, polyvinyl chloride (PVC).*

Table 2.1: Ambient Air Quality Standards

Ambient Air Quality Standards						
Pollutant	Average Time	California Standards[1]		Federal Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m3)	Ultraviolet Photometry	-	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m3)		0.075 ppm (147 µg/m3)		
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m3	Gravimetric or Beta Attenuation	150 µg/m3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m3		-		
Fine Particulate Matter PM2.5	24 Hour	No Separate State Standard		35 µg/m3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m3	Gravimetric or Beta Attenuation	15 µg/m3		
Carbon Monoxide (CO)	8 hour	9.0 ppm (10mg/m3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m3)	None	Non-Dispersive Infrared Photometry
	1 hour	20 ppm (23 mg/m3)		35 ppm (40 mg/m3)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m3)		-	-	-
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m3)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m3)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm (339 µg/m3)		0.100 ppm[8]		
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	-	Ultraviolet Fluorescence	0.030 ppm (80 µg/m3)	-	Spectrophotometry (Pararosaniline Method)
	24 Hour	0.04 ppm (105 µg/m3)		0.14 ppm (365 µg/m3)	-	
	3 Hour	-		-	0.5 ppm (1300 µg/m3)	
	1 Hour	0.25 ppm (655 µg/m3)		-	-	-
Lead[10]	30 Day Average	1.5 µg/m3	Atomic Absorption	-		-
	Calendar Quarter			1.5 µg/m3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average			0.15 µg/m3		
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer - visibility of ten miles or more (0.07 -30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape				
Sulfates	24 Hour	25 µg/m3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m3)	Ultraviolet Fluorescence			
Vinyl Chloride[8]	24 Hour	0.01 ppm (26 µg/m3)	Gas Chromatography			

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM10, PM2.5, and visibility reducing articles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m3 is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.
5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
7. Reference method as described by the EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the EPA.
8. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).
9. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).
10. National lead standard, rolling 3-month average: final rule signed October 15, 2008.

Source: California Air Resources Board (2/16/10)

2.3.3 Regional Standards

The State of California has 35 specific air districts, which are each responsible for ensuring that the criteria pollutants are below the NAAQS and CAAQS. Air basins that exceed either the NAAQS or the CAAQS for any criteria pollutants are designated as "non-attainment areas" for that pollutant. Currently, there are 15 non-attainment areas for the federal ozone standard and two non-attainment areas for the PM2.5 standard. The state therefore created the California State Implementation Plan (SIP), which is designed to provide control measures needed for California Air basins to attain ambient air quality standards.

The San Diego Air Pollution Control District (SDAPCD) is the government agency which regulates sources of air pollution within San Diego County. Currently, San Diego is in "non-attainment" status for O_3 and PM_{10}. Therefore, the County of San Diego developed a Regional Air Quality Strategy (RAQS) to provide control measures to try to achieve attainment status as required for the SIP. The RAQS was adopted in 1991 and has been updated as recently as 2004. Criteria pollutant standards are generally attained when each monitor within the region has had no exceedances during the previous three calendar years. A complete listing of the current attainment status by pollutants for San Diego County is shown on Table 2.2 below.

2.4 California Environmental Quality Act (CEQA) Significance Thresholds

The California Environmental Quality Act has provided a checklist to identify the significance of air quality impacts. These guidelines are found in Appendix G of the CEQA guidelines and are as follows:

AIR QUALITY -- Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

A: Conflict with or obstruct implementation of the applicable air quality plan?

B: Violate any air quality standard or contribute substantially to an existing or project air quality violation?

C: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

D: Expose sensitive receptors to substantial pollutant concentrations?

E: Create objectionable odors affecting a substantial number of people `?

Table 2.2: San Diego County Air Basin Attainment Status by Pollutant

San Diego County Air Basin Attainment Status by Pollutant			
Pollutant	Average Time	California Standards	Federal Standards
Ozone (O_3)	1 Hour	Non-attainment	No Federal Standard
	8 Hour		Basic Non-attainment
Respirable Particulate Matter (PM10)	Annual Arithmetic Mean	Non-attainment	No Federal Standard
	24 Hour	Non-attainment	Unclassified[1]
	Annual Arithmetic Mean	No State Standard	Unclassified[2]
Fine Particulate Matter PM2.5	24 Hour	No State Standard	Attainment
	Annual Arithmetic Mean	Non-attainment	Attainment
Carbon Monoxide (CO)	8 hour	Attainment	Maintenance Area[3]
	1 hour		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	No State Standard	Attainment
	1 Hour	Attainment	No Federal Standard
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	No State Standard	Attainment
	24 Hour	Attainment	Attainment
	1 Hour	Attainment	No Federal Standard
Lead	30 Day Average	Attainment	No Federal Standard
	Calendar Quarter	No State Standard	Attainment
Visibility Reducing Particles	8 Hour (10AM to 6PM, PST)	Unclassified	No Federal Standard
Sulfates	24 Hour	Attainment	No Federal Standard
Hydrogen Sulfide	1 Hour	Unclassified	No Federal Standard

1. Data reflects status as of March 19, 2007.
2. Unclassified; indicates data are not sufficient for determining attainment or nonattainment.
3. Maintenance Area (defined by U.S. Department of Transportation) is any geographic region of the United States previously designated nonattainment pursuant t o the CAA Amendments of 1990 and subsequently redesignated to attainment subject to the requirement to develop a maintenance plan under section 175A of the CAA, as amended.

2.5 SDAPCD Rule 20.2 – Air Quality Impact Assessment Screening Thresholds

The SDAPCD has established a threshold in Rule 20.2 for the preparation of Air Quality Impact Assessments (AQIA). These screening criteria can be used to demonstrate that a project's total emissions would not result in a significant impact as defined by CEQA. Should emissions be found to exceed these thresholds, additional modeling is required to demonstrate that the project's total air quality impacts are below the state and federal ambient air quality standards. These screening thresholds for construction and daily operations are shown in Table 2.3 below.

Non Criteria pollutants such as Hazardous Air Pollutants (HAPs) or Toxic Air Contaminants (TACs) are also regulated by the San Diego Air Pollution Control District (SDAPCD). Rule 1200 (Toxic Air Contaminants - New Source Review) adopted on June 12, 1996, requires evaluation of potential health risks for any new, relocated, or modified emission unit which may increase emissions of one or more toxic air contaminants. The rule requires that projects that propose to increase

cancer risk to between 1 and 10 in one million need to implement toxics best available control technology (T-BACT) or impose the most effective emission limitation, emission control device or control technique to reduce the cancer risk. At no time shall the project increase the cancer risk to over 10 in one million.

This report assumes that Volatile Organic Compounds (VOC) and Reactive Organic Gases (ROG) are essentially the same due to the fact that emissions generated from the project represent non-methane organic compounds. Additionally, South Coast Air Quality Management District (SCAQMD) utilizes VOC standards.

Table 2.3: Screening Threshold for Criteria Pollutants

Pollutant	Total Emissions (Pounds per Day)
Construction Emissions	
Respirable Particulate Matter (PM_{10} /$PM_{2.5}$)	100/55
Nitrogen Oxide (NO_x)	250
Sulfur Oxide (SO_x)	250
Carbon Monoxide (CO)	550
Volatile Organic Compounds (VOCs)	75
Reactive Organic Gases (ROGs)	75

2.6 Local Air Quality

Criteria pollutants are measured continuously throughout the San Diego Air Basin (SDAB). This data is used to track ambient air quality patterns throughout the County. As mentioned earlier, this data is also used to determine attainment status when compared to the NAAQS and CAAQS.

The SDAPCD is responsible for monitoring and reporting monitoring data. The District operates 10 monitoring sites that collect data on criteria pollutants. Figure 2-A below shows the relative locations of the ambient monitoring stations. Additionally, because the project site is located on the northeastern edge of the SDAB adjacent to the Salton Sea Air Basin (SSAB), SSAB monitoring sites were also used to determine ambient air quality conditions. Figure 2-B on the following page shows the SSAB monitoring locations.

The proposed development project is closest to the SDAB site located in Alpine as well as the SSAB Westmorland monitoring site. Table 2.4 on Page 16 of this report identifies the criteria pollutants monitored at these stations.

FIGURE 2-A: Ambient Air Quality Monitoring Stations within SDAB – CARB

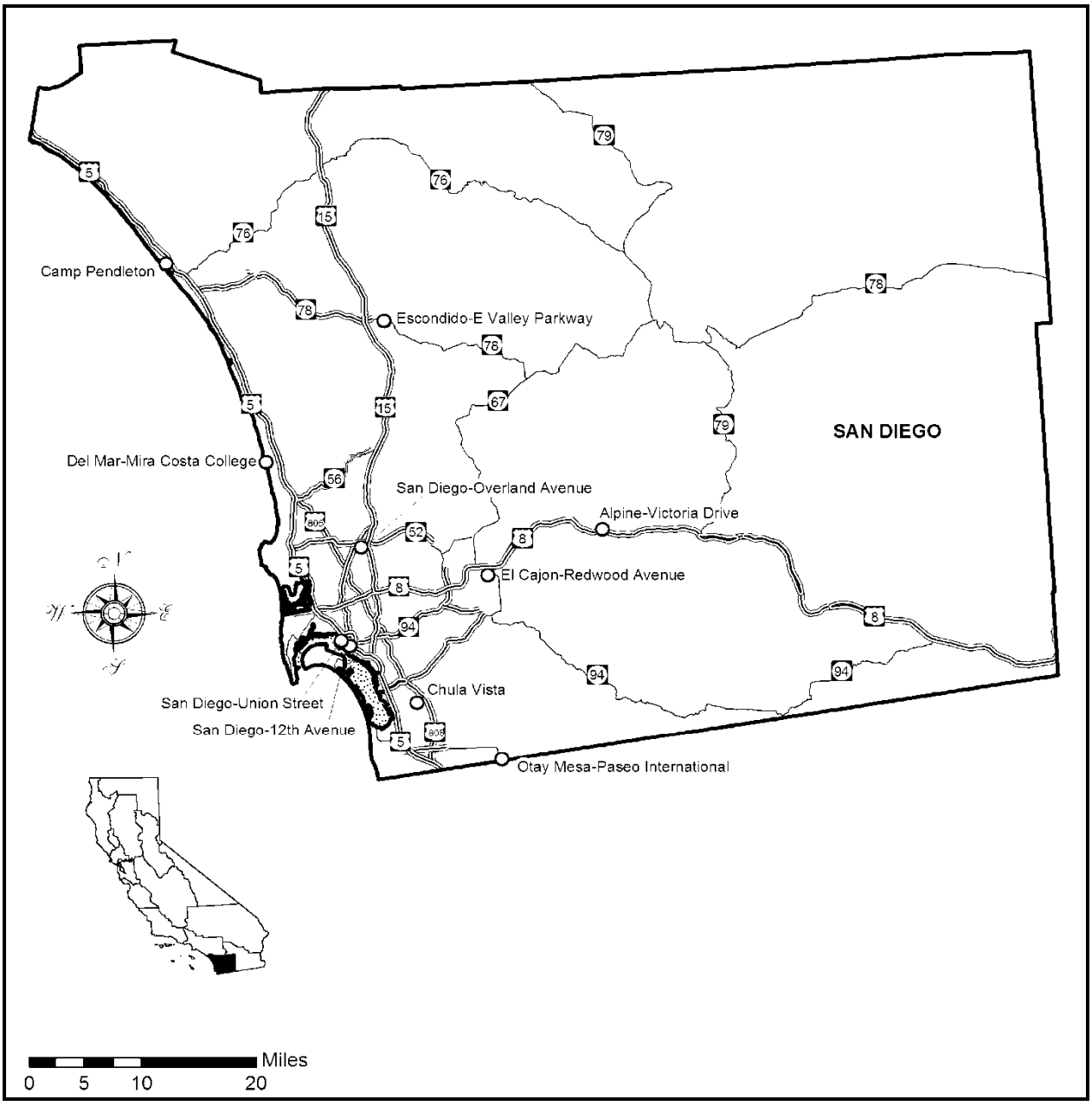


FIGURE 2-B: Ambient Air Quality Monitoring Stations within SSAB – CARB

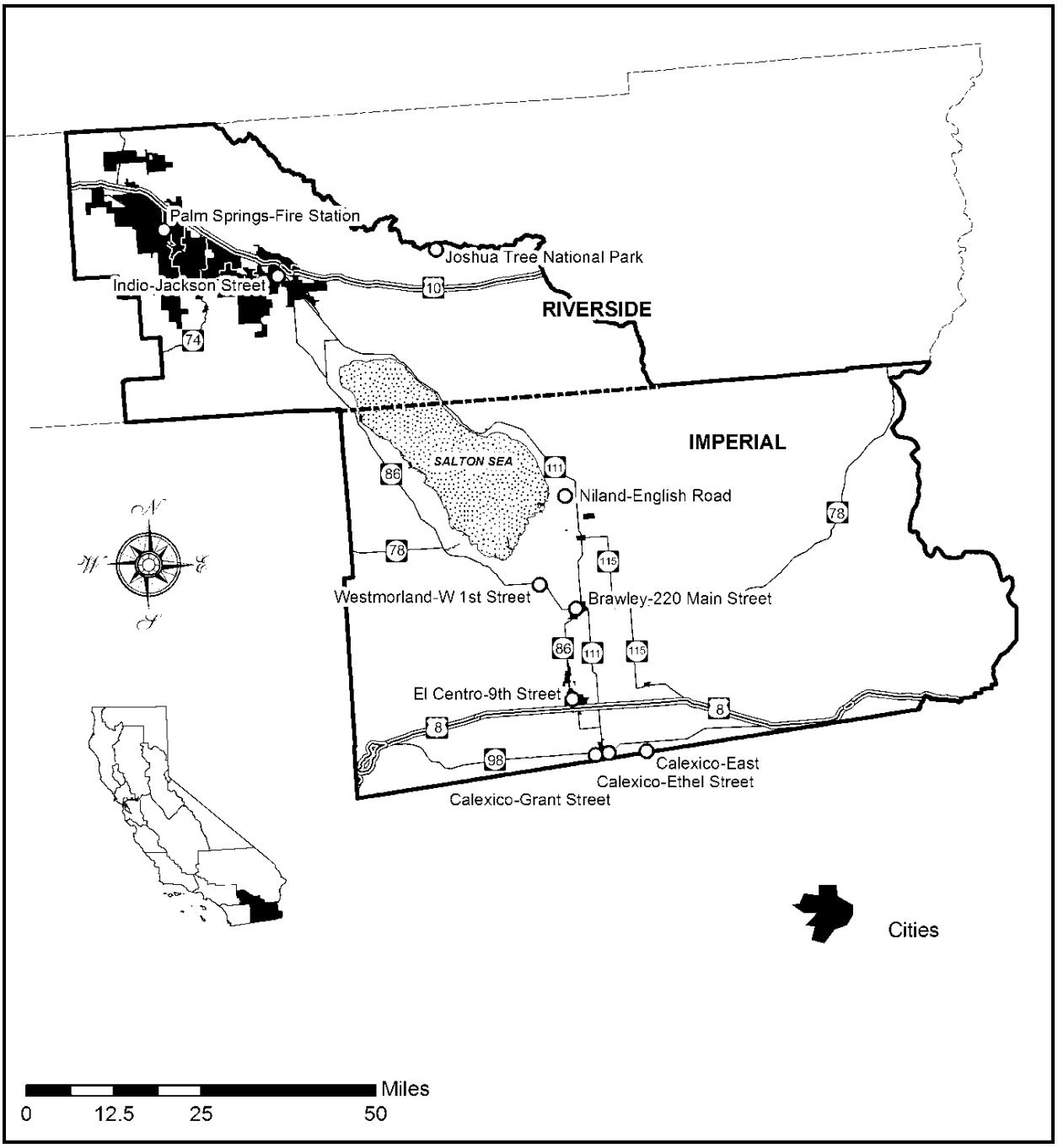


Table 2.4: Three-Year Ambient Air Quality Summary near the Project Site

Pollutant	Closest Recorded Ambient Monitoring Site	Averaging Time	CAAQS	NAAQS	2006	2007	2008
O3 (ppm)	Westmorland-W 1st Street	1 Hour	0.09 ppm	-	0.10	0.10	0.10
	Westmorland-W 1st Street	8 Hour	0.070 ppm	0.075 ppm	0.09	0.09	0.09
PM10 (µg/m3)	Westmorland-W 1st Street	24 Hour	50 µg/m3	150 µg/m3	167	226	136
PM2.5 (µg/m3)	Alpine – Victoria Drive	24 Hour	-	35 µg/m3	N/A	41	37
	Alpine – Victoria Drive	Annual Arithmetic Mean	12 µg/m3	15 µg/m3	N/A	N/A	14
NO2 (ppm)	Alpine – Victoria Drive	Annual Arithmetic Mean	0.030 ppm	0.053 ppm	0.010	0.010	0.008
	Alpine – Victoria Drive	1 Hour	0.18 ppm	-	0.057	0.057	0.047

3.0 METHODOLOGY

3.1 Construction Emissions Calculations

Air quality impacts related to construction were calculated using the latest URBEMIS2007 air quality model, which was developed by ARB. URBEMIS2007 has been approved by SDAPCD and San Diego County for construction emission calculations. URBEMIS incorporates emission factors from the EMFAC2007 model for on-road vehicle emissions and the OFFROAD2007 model for off-road vehicle emissions. Default settings were used within the model.

Cancer Risk will be determined for Diesel Particulate Matter (DPM) at the point of maximum exposure. The SCREEN3 dispersion model can be used to determine the concentration for air pollutants at any location near the pollutant generator. Additionally, the model will predict the maximum exposure distance and concentration. Ldn Consulting utilized the worst case exhaust emissions generated from the Project from construction equipment as calculated within the URBEMIS2007 model. The worst case cancer risk if exposed to a DPM dose for 70 years is defined as:

$$CR_{DPM} = C_{DPM} \times URF_{DPM}$$

Where, CR_{DPM} = Cancer risk from diesel particulate matter (DPM) (probability on an individual developing Cancer

C_{DPM} = Annual average DPM concentration in µg/m3

URF_{DPM} = Unit risk factor is .0003 per continuous exposure of 1 $\mu g/m^3$ of DPM over 70-year period per person)

(Source: Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling emissions for CEQA Air Quality Analysis (August 2003))

3.2 Construction Assumptions

The entire Project site would be grubbed to remove site vegetation in approximately two weeks and site compacting would be completed in about one month. Total construction of the proposed 26 MWac phase should be completed in 4 to 6 months. This includes the onsite work and the additional transmission line work to SDGE's substation. This assumption also includes all work necessary to provide onsite access roads and the necessary work for setting and installing the photovoltaic panels which were assumed in the Building Construction component of the project.

It should be noted that if fixed-tilt mounting is used, there are two separate trenching and building construction components to the project which separate the installation of the first 26 MWac phase and the completion of the project with the installation of the remaining 9 MWac phase. The second phase of the fixed-tilt project would be built in less than half the time of the first phase because it is smaller and all Project infrastructure (access, gen-tie line, etc) would already be in place. Table 3.1 below shows the expected timeframes for the construction process at the Project location using fixed-tilt construction as the worst case.

Table 3.1: Expected Construction Equipment and Durations

Equipment Identification	Proposed Dates	Quantity	Load Factor	Hours per day
Mass Site Grading	6/01/2011 – 7/15/2011			
Dozer		3	.59	8
Graders		5	.61	8
Tractors/loaders/Backhoes		4	.55	8
Water Trucks		4	.50	8
Trenching	7/16/2011 – 08/15/2011			
Tractors/loaders/Backhoes		5	.55	8
Trenchers		2	.75	8
Water Trucks		1	.50	8
Building Construction	8/16/2011 – 10/01/2011			
Bore/Drill Rig		2	.75	8
Cranes		2	.43	7
Air Compressor		1	.48	8
Forklifts		1	.30	8
Generator		1	.74	8
Welders		1	.45	8
Trenching	10/02/2011 – 10/16/2011			
Tractors/loaders/Backhoes		5	.55	8
Trenchers		2	.75	8
Water Trucks		1	.50	8
Building Construction	10/17/2011 – 12/01/2011			
Bore/Drill Rig		2	.75	8
Cranes		2	.43	7
Air Compressor		1	.48	8
Forklifts		1	.30	8
Generator		1	.74	8
Welders		1	.45	8

This equipment list is based upon equipment inventory within URBEMIS2007. The quantity and types are based upon assumptions from projects of similar size and scope.

3.3 Operational Impacts

Daily operations of the project will involve primarily periodic maintenance and worker trips only and although emissions are expected, they would be minimal and would be below the screening level thresholds within the San Diego County Guidelines for Determining Significance.

Fugitive dust emissions from the project site during operations could have a potentially significant impact on PM10 concentrations in the area. In order to mitigate for fugitive dust caused from operation of the site a permeable soil-binding or permeable rock material shall be used to limit the dust. A non-toxic, biodegradable permeable soil-binding agent or permeable rock material will be applied to all disturbed or exposed surface areas as follows:

a. A permeable soil-binding agent suitable for both traffic and non-traffic areas shall be used. These agent shall be are biodegradable, eco-safe, with liquid copolymers that stabilize and solidify soils or aggregates, which and facilitate dust suppression.

b. Alternatively, a permeable rock material consisting of either river stone decomposed granite or gravel could be placed in a thin cover over all exposed surface area in-lieu of the binding agent referenced above.

c. In-lieu of, or in combination with #1 and #2 above, the areas located between the arrays, and any non-drivable surface may be revegetated with native noninvasive plant species. A Revegetation Plan, shall be prepared, that which provides sufficient ground cover to mitigate fugitive dust from the ground disturbances. The revegetation plan shall conform to the most current version of the County of San Diego Report Format and Content Requirements for Revegetation Plans.

4.0 FINDINGS

4.1 Construction Findings

Air quality impacts related to construction will be calculated using the latest URBEMIS2007 air quality model, which was developed by ARB. URBEMIS2007 has been approved by SDAPCD and the County for construction emission calculations. URBEMIS incorporates emission factors from the EMFAC2007 model for on-road vehicle emissions and the OFFROAD2007 model for off-road vehicle emissions.

Construction analysis for the Project assumes that the contractor will utilize equipment in compliance with SDAPCD T/BACT requirements. Construction grading would take roughly nine weeks to complete, seven weeks for trenching activities and up to ten months for the entire Project to be completed, start to finish, including the upgrades to the offsite power line infrastructure. A summary of the construction emissions is shown in Table 4.1 below and the URBEMIS model outputs are provided as ***Attachment A*** of this report. Given these findings, PM10 emissions would exceed SDAPCD air quality standard of 100 lbs/day and would require mitigation to comply.

Table 4.1: Expected Construction Emissions Summary

Year	ROG	NO_x	CO	SO_2	PM_{10} (Dust)	PM_{10} (Exhaust)	PM_{10} (Total)	$PM_{2.5}$ (Dust)	$PM_{2.5}$ (Exhaust)	$PM_{2.5}$ (Total)
2011 (lb/day) Unmitigated	13.42	108.96	60.79	0	200.2	5.64	205.66	41.78	5.18	49.96
Significance Threshold (lb/day)	75	250	550	250	-	-	100	-	-	55
SDAPCD Impact?	No	No	No	No	-	-	**Yes**	-	-	No
2011(lb/day) Mitigated	13.42	108.96	60.79	0	88.96	5.64	94.60	18.58	5.18	23.77
SDAPCD Impact?	No	No	No	No	-	-	No	-	-	No

It was found that the following mitigation measures would be required to reduce PM10 impacts to a level below significance:

1. *Apply water during grading/grubbing activities to all active disturbed areas at least twice daily.*

2. *Apply water to all onsite roadways at least three times daily or use of magnesium chloride or other County approved dust suppression additives and apply water one-time daily.*
3. *Reduce all construction related traffic speeds onsite to below 15 Miles per Hour (MPH).*

The above mitigation recommendations are based on control efficiencies established by SCAQMD CEQA air quality handbook and recommended within the URBEMIS 2007 air quality model. The CEQA handbook states that watering twice daily can reduce PM10 from 34-68% however; LDN Consulting utilized an average 51%.

4.2 Health Risk

Based upon this air quality modeling, we find that worst-case PM_{10} from exhaust could be as high 5.99 lbs per construction day (8-hours) or 0.0969 grams per second DPM during the construction day. Averaging this emission rate over the Project site area gives us the average emission rate for the Project area. Converting pounds (lbs) per day to grams per second is shown below:

$$\frac{5.64\frac{lb}{day}*453\frac{grams}{lb}}{28{,}000\frac{\text{sec}onds}{Constructionday}}=0.0912\frac{grams}{\text{sec}ond}$$

The average emission rate over the grading area is $7.318\text{x}10^{-8}$ g/m^2/s, which was calculated as follows:

$$\frac{0.0912\frac{grams}{\text{sec}ond}}{308acres*4{,}046\frac{meters^2}{acre}}=7.318*10^{-8}\frac{\frac{grams}{meters^2}}{\text{sec}ond}$$

Utilizing the SCREEN3 dispersion model, we find that the peak maximum 1-hr concentration is 9.269 µg/m^3 during grading at a distance of roughly 800 meters from the centroid of the Project site. This concentration would be lowered at any other distance from the project site. Utilizing the risk equation identified in Chapter 3 we calculate that the cancer risk over a 70-year continuous dose would be:

$$CR_{\text{DPM-70yr dose}} = 0.0003 \text{ x } 9.269 = 2.78 \text{ x } 10^{-3}$$

Based on these calculations, The Project is expected to generate maximum DPM during grading of the project, which is expected to take approximately two months with workdays of eight hours per day during a typical five-day week. This would work out to 15-24 hr days out of 70 years or 15/25,550 or .00059 times the CR_{DPM}. If one million people were exposed to the maximum DPM for the duration of grading at 833 meters from the project site, the estimated increased cancer risk could be:

0.00059 x .00278 x 1,000,000 = 1.63 individuals per million

The numerical number of individuals exposed to DPM of this concentration from the project would be less than ten in one million. Therefore, no impacts are expected. No mitigation would be necessary. The SCREEN3 dispersion model outputs are provided as ***Attachment B*** to this report.

4.3 Conclusion of Findings

Based upon our analysis of construction activities for the proposed Borrego PV Solar Farm, PM_{10} impacts are expected during the construction phase of the Project if mitigation measures are not employed. The following mitigation requirements will be required to reduce construction related impacts to a level below significance:

1. *Apply water during grading/grubbing activities to all active disturbed areas at least three times daily.*
2. *Apply water to all onsite roadways at least three times daily or use of magnesium chloride or other County approved dust suppression additives and apply water one-time daily.*
3. *Reduce all construction related traffic speeds onsite to below 15 Miles per Hour (MPH).*

Additionally, there are no cumulative projects located within one mile of the project site that could undergo construction at the same time as the project. Therefore, the project would not have a cumulative impact to air quality during construction with incorporation of the mitigation measures listed above.

5.0 CERTIFICATIONS

The contents of this report represent an accurate depiction of the air quality environment and impacts within and surrounding the Borrego 1 Solar Project. The report was prepared by Jeremy Louden; a County approved CEQA Consultant for Air Quality.

Jeremy Louden
Principal
Ldn Consulting, Inc.

ATTACHMENT A

URBEMIS 2007

1/12/2011 10:11:24 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Jeremy 10-18-10\Borrego One Solar\Borego1solar.urb924

Project Name: Borrego one Solar Project

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2011 TOTALS (tons/year unmitigated)	0.44	3.40	1.81	0.00	3.30	0.18	3.48	0.69	0.17	0.86	399.51
2011 TOTALS (tons/year mitigated)	0.44	3.40	1.81	0.00	1.47	0.18	1.65	0.31	0.17	0.47	399.51
Percent Reduction	0.00	0.00	0.00	0.00	55.52	0.00	52.62	55.51	0.00	44.69	0.00

1/12/2011 10:12:07 PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Jeremy 10-18-10\Borrego One Solar\Borego1solar.urb924

Project Name: Borrego one Solar Project

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2011 TOTALS (lbs/day unmitigated)	13.42	108.96	60.79	0.00	200.02	5.64	205.66	41.78	5.18	46.96	10,859.65
2011 TOTALS (lbs/day mitigated)	13.42	108.96	60.79	0.00	88.96	5.64	94.60	18.58	5.18	23.77	10,859.65

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

1/12/2011 10:12:07 PM

Time Slice 6/1/2011-7/15/2011 Active Days: 33	13.42	108.96	60.79	0.00	200.02	5.64	205.66	41.78	5.18	46.96	10,859.65
Mass Grading 06/01/2011-07/15/2011	13.42	108.96	60.79	0.00	200.02	5.64	205.66	41.78	5.18	46.96	10,859.65
Mass Grading Dust	0.00	0.00	0.00	0.00	200.00	0.00	200.00	41.77	0.00	41.77	0.00
Mass Grading Off Road Diesel	13.29	108.74	56.71	0.00	0.00	5.63	5.63	0.00	5.18	5.18	10,450.88
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.13	0.22	4.08	0.00	0.02	0.01	0.03	0.01	0.01	0.02	408.77
Time Slice 7/18/2011-8/15/2011 Active Days: 21	4.75	31.14	19.96	0.00	0.01	2.51	2.52	0.00	2.30	2.31	3,091.96
Trenching 07/16/2011-08/15/2011	4.75	31.14	19.96	0.00	0.01	2.51	2.52	0.00	2.30	2.31	3,091.96
Trenching Off Road Diesel	4.68	31.03	17.92	0.00	0.00	2.50	2.50	0.00	2.30	2.30	2,887.58
Trenching Worker Trips	0.07	0.11	2.04	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.38
Time Slice 8/16/2011-9/30/2011 Active Days: 34	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building 08/16/2011-10/01/2011	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building Off Road Diesel	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Time Slice 10/3/2011-10/14/2011 Active Days: 10	2.13	14.40	8.60	0.00	0.01	0.99	1.00	0.00	0.91	0.91	1,454.67
Trenching 10/02/2011-10/16/2011	2.13	14.40	8.60	0.00	0.01	0.99	1.00	0.00	0.91	0.91	1,454.67
Trenching Off Road Diesel	2.06	14.29	6.56	0.00	0.00	0.98	0.98	0.00	0.90	0.90	1,250.28
Trenching Worker Trips	0.07	0.11	2.04	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.38

Time Slice 10/17/2011-12/1/2011 Active Days: 34	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building 10/17/2011-12/01/2011	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building Off Road Diesel	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

Phase: Mass Grading 6/1/2011 - 7/15/2011 - Grubbing and Mass Grading

Total Acres Disturbed: 308

Maximum Daily Acreage Disturbed: 10

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

5 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

3 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

4 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

4 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 7/16/2011 - 8/15/2011 - trenching Phase one

Off-Road Equipment:

5 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

2 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 10/2/2011 - 10/16/2011 - Trenching Phase two

Off-Road Equipment:

5 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

2 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 8/16/2011 - 10/1/2011 - Construction of PV systems Phase One

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

2 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day

2 Cranes (399 hp) operating at a 0.43 load factor for 7 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Building Construction 10/17/2011 - 12/1/2011 - Construction of PV systems Phase Two

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

2 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day

2 Cranes (399 hp) operating at a 0.43 load factor for 7 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

Time Slice 6/1/2011-7/15/2011 Active Days: 33	13.42	108.96	60.79	0.00	88.96	5.64	94.60	18.58	5.18	23.77	10,859.65
Mass Grading 06/01/2011-07/15/2011	13.42	108.96	60.79	0.00	88.96	5.64	94.60	18.58	5.18	23.77	10,859.65
Mass Grading Dust	0.00	0.00	0.00	0.00	88.94	0.00	88.94	18.58	0.00	18.58	0.00
Mass Grading Off Road Diesel	13.29	108.74	56.71	0.00	0.00	5.63	5.63	0.00	5.18	5.18	10,450.88
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.13	0.22	4.08	0.00	0.02	0.01	0.03	0.01	0.01	0.02	408.77
Time Slice 7/18/2011-8/15/2011 Active Days: 21	4.75	31.14	19.96	0.00	0.01	2.51	2.52	0.00	2.30	2.31	3,091.96
Trenching 07/16/2011-08/15/2011	4.75	31.14	19.96	0.00	0.01	2.51	2.52	0.00	2.30	2.31	3,091.96
Trenching Off Road Diesel	4.68	31.03	17.92	0.00	0.00	2.50	2.50	0.00	2.30	2.30	2,887.58
Trenching Worker Trips	0.07	0.11	2.04	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.38
Time Slice 8/16/2011-9/30/2011 Active Days: 34	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building 08/16/2011-10/01/2011	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building Off Road Diesel	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Time Slice 10/3/2011-10/14/2011 Active Days: 10	2.13	14.40	8.60	0.00	0.01	0.99	1.00	0.00	0.91	0.91	1,454.67
Trenching 10/02/2011-10/16/2011	2.13	14.40	8.60	0.00	0.01	0.99	1.00	0.00	0.91	0.91	1,454.67
Trenching Off Road Diesel	2.06	14.29	6.56	0.00	0.00	0.98	0.98	0.00	0.90	0.90	1,250.28
Trenching Worker Trips	0.07	0.11	2.04	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.38

Time Slice 10/17/2011-12/1/2011 Active Days: 34	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building 10/17/2011-12/01/2011	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building Off Road Diesel	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 6/1/2011 - 7/15/2011 - Grubbing and Mass Grading

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 51% PM25: 51%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 51% PM25: 51%

1/12/2011 10:11:04 PM

Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: C:\Jeremy 10-18-10\Borrego One Solar\Borego1solar.urb924

Project Name: Borrego one Solar Project

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2011 TOTALS (lbs/day unmitigated)	13.42	108.96	60.79	0.00	200.02	5.64	205.66	41.78	5.18	46.96	10,859.65
2011 TOTALS (lbs/day mitigated)	13.42	108.96	60.79	0.00	88.96	5.64	94.60	18.58	5.18	23.77	10,859.65

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

1/12/2011 10:11:04 PM

Time Slice 6/1/2011-7/15/2011 Active Days: 33	13.42	108.96	60.79	0.00	200.02	5.64	205.66	41.78	5.18	46.96	10,859.65
Mass Grading 06/01/2011-07/15/2011	13.42	108.96	60.79	0.00	200.02	5.64	205.66	41.78	5.18	46.96	10,859.65
Mass Grading Dust	0.00	0.00	0.00	0.00	200.00	0.00	200.00	41.77	0.00	41.77	0.00
Mass Grading Off Road Diesel	13.29	108.74	56.71	0.00	0.00	5.63	5.63	0.00	5.18	5.18	10,450.88
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.13	0.22	4.08	0.00	0.02	0.01	0.03	0.01	0.01	0.02	408.77
Time Slice 7/18/2011-8/15/2011 Active Days: 21	4.75	31.14	19.96	0.00	0.01	2.51	2.52	0.00	2.30	2.31	3,091.96
Trenching 07/16/2011-08/15/2011	4.75	31.14	19.96	0.00	0.01	2.51	2.52	0.00	2.30	2.31	3,091.96
Trenching Off Road Diesel	4.68	31.03	17.92	0.00	0.00	2.50	2.50	0.00	2.30	2.30	2,887.58
Trenching Worker Trips	0.07	0.11	2.04	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.38
Time Slice 8/16/2011-9/30/2011 Active Days: 34	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building 08/16/2011-10/01/2011	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building Off Road Diesel	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Time Slice 10/3/2011-10/14/2011 Active Days: 10	2.13	14.40	8.60	0.00	0.01	0.99	1.00	0.00	0.91	0.91	1,454.67
Trenching 10/02/2011-10/16/2011	2.13	14.40	8.60	0.00	0.01	0.99	1.00	0.00	0.91	0.91	1,454.67
Trenching Off Road Diesel	2.06	14.29	6.56	0.00	0.00	0.98	0.98	0.00	0.90	0.90	1,250.28
Trenching Worker Trips	0.07	0.11	2.04	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.38

Time Slice 10/17/2011-12/1/2011 Active Days: 34	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building 10/17/2011-12/01/2011	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building Off Road Diesel	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

Phase: Mass Grading 6/1/2011 - 7/15/2011 - Grubbing and Mass Grading

Total Acres Disturbed: 308

Maximum Daily Acreage Disturbed: 10

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

5 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

3 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

4 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

4 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 7/16/2011 - 8/15/2011 - trenching Phase one

Off-Road Equipment:

5 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

2 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 10/2/2011 - 10/16/2011 - Trenching Phase two

Off-Road Equipment:

5 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

2 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 8/16/2011 - 10/1/2011 - Construction of PV systems Phase One

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

2 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day

2 Cranes (399 hp) operating at a 0.43 load factor for 7 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Building Construction 10/17/2011 - 12/1/2011 - Construction of PV systems Phase Two

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

2 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day

2 Cranes (399 hp) operating at a 0.43 load factor for 7 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

Time Slice 6/1/2011-7/15/2011 Active Days: 33	13.42	108.96	60.79	0.00	88.96	5.64	94.60	18.58	5.18	23.77	10,859.65
Mass Grading 06/01/2011-07/15/2011	13.42	108.96	60.79	0.00	88.96	5.64	94.60	18.58	5.18	23.77	10,859.65
Mass Grading Dust	0.00	0.00	0.00	0.00	88.94	0.00	88.94	18.58	0.00	18.58	0.00
Mass Grading Off Road Diesel	13.29	108.74	56.71	0.00	0.00	5.63	5.63	0.00	5.18	5.18	10,450.88
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.13	0.22	4.08	0.00	0.02	0.01	0.03	0.01	0.01	0.02	408.77
Time Slice 7/18/2011-8/15/2011 Active Days: 21	4.75	31.14	19.96	0.00	0.01	2.51	2.52	0.00	2.30	2.31	3,091.96
Trenching 07/16/2011-08/15/2011	4.75	31.14	19.96	0.00	0.01	2.51	2.52	0.00	2.30	2.31	3,091.96
Trenching Off Road Diesel	4.68	31.03	17.92	0.00	0.00	2.50	2.50	0.00	2.30	2.30	2,887.58
Trenching Worker Trips	0.07	0.11	2.04	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.38
Time Slice 8/16/2011-9/30/2011 Active Days: 34	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building 08/16/2011-10/01/2011	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building Off Road Diesel	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Time Slice 10/3/2011-10/14/2011 Active Days: 10	2.13	14.40	8.60	0.00	0.01	0.99	1.00	0.00	0.91	0.91	1,454.67
Trenching 10/02/2011-10/16/2011	2.13	14.40	8.60	0.00	0.01	0.99	1.00	0.00	0.91	0.91	1,454.67
Trenching Off Road Diesel	2.06	14.29	6.56	0.00	0.00	0.98	0.98	0.00	0.90	0.90	1,250.28
Trenching Worker Trips	0.07	0.11	2.04	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.38

Time Slice 10/17/2011-12/1/2011 Active Days: 34	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building 10/17/2011-12/01/2011	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building Off Road Diesel	4.63	35.24	16.21	0.00	0.00	1.69	1.69	0.00	1.55	1.55	5,311.25
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 6/1/2011 - 7/15/2011 - Grubbing and Mass Grading

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 51% PM25: 51%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 51% PM25: 51%

ATTACHMENT B

SCREEN 3

```
 ***  SCREEN3 MODEL RUN  ***
 *** VERSION DATED 96043 ***

Borrego One Solar

SIMPLE TERRAIN INPUTS:
   SOURCE TYPE                =          AREA
   EMISSION RATE (G/(S-M**2))  =      .731800E-07
   SOURCE HEIGHT (M)          =        3.0000
   LENGTH OF LARGER SIDE (M)   =     1116.4400
   LENGTH OF SMALLER SIDE (M)  =     1116.4400
   RECEPTOR HEIGHT (M)        =        2.0000
   URBAN/RURAL OPTION         =         RURAL
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

   MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION


BUOY. FLUX =     .000 M**4/S**3;  MOM. FLUX =     .000 M**4/S**2.

*** FULL METEOROLOGY ***

**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************

*** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

  DIST     CONC                 U10M   USTK  MIX HT   PLUME  MAX DIR
   (M)   (UG/M**3)   STAB   (M/S)  (M/S)    (M)   HT (M)   (DEG)
-------  ----------  ----  -----  -----  ------  ------  -------
    10.   6.437        6     1.0    1.0 10000.0    3.00     45.
   100.   6.857        6     1.0    1.0 10000.0    3.00     45.
   200.   7.290        6     1.0    1.0 10000.0    3.00     45.
   300.   7.691        6     1.0    1.0 10000.0    3.00     45.
   400.   7.971        6     1.0    1.0 10000.0    3.00     45.
   500.   8.338        6     1.0    1.0 10000.0    3.00     45.
   600.   8.689        6     1.0    1.0 10000.0    3.00     45.
   700.   9.025        6     1.0    1.0 10000.0    3.00     45.
   800.   9.269        6     1.0    1.0 10000.0    3.00     45.
   900.   8.099        6     1.0    1.0 10000.0    3.00     45.
  1000.   7.253        6     1.0    1.0 10000.0    3.00     45.
  1100.   6.595        6     1.0    1.0 10000.0    3.00     45.
  1200.   6.075        6     1.0    1.0 10000.0    3.00     45.
  1300.   5.659        6     1.0    1.0 10000.0    3.00     45.
  1400.   5.319        6     1.0    1.0 10000.0    3.00     45.
  1500.   5.035        6     1.0    1.0 10000.0    3.00     45.
  1600.   4.793        6     1.0    1.0 10000.0    3.00     45.
  1700.   4.581        6     1.0    1.0 10000.0    3.00     45.
  1800.   4.395        6     1.0    1.0 10000.0    3.00     45.
  1900.   4.227        6     1.0    1.0 10000.0    3.00     45.
  2000.   4.077        6     1.0    1.0 10000.0    3.00     45.
  2100.   3.940        6     1.0    1.0 10000.0    3.00     45.
  2200.   3.815        6     1.0    1.0 10000.0    3.00     45.
  2300.   3.701        6     1.0    1.0 10000.0    3.00     45.
  2400.   3.597        6     1.0    1.0 10000.0    3.00     45.
  2500.   3.501        6     1.0    1.0 10000.0    3.00     45.
  2600.   3.413        6     1.0    1.0 10000.0    3.00     45.
  2700.   3.332        6     1.0    1.0 10000.0    3.00     45.
  2800.   3.257        6     1.0    1.0 10000.0    3.00     45.
```

2900.	3.186	6	1.0	1.0 10000.0	3.00	45.
3000.	3.120	6	1.0	1.0 10000.0	3.00	45.
3500.	2.842	6	1.0	1.0 10000.0	3.00	45.
4000.	2.626	6	1.0	1.0 10000.0	3.00	45.
4500.	2.447	6	1.0	1.0 10000.0	3.00	45.
5000.	2.294	6	1.0	1.0 10000.0	3.00	45.
5500.	2.161	6	1.0	1.0 10000.0	3.00	45.
6000.	2.043	6	1.0	1.0 10000.0	3.00	45.
6500.	1.937	6	1.0	1.0 10000.0	3.00	45.
7000.	1.844	6	1.0	1.0 10000.0	3.00	45.
7500.	1.761	6	1.0	1.0 10000.0	3.00	45.
8000.	1.687	6	1.0	1.0 10000.0	3.00	45.
8500.	1.619	6	1.0	1.0 10000.0	3.00	45.
9000.	1.555	6	1.0	1.0 10000.0	3.00	44.
9500.	1.496	6	1.0	1.0 10000.0	3.00	45.
10000.	1.441	6	1.0	1.0 10000.0	3.00	45.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 10. M:

800.	9.269	6	1.0	1.0 10000.0	3.00	45.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	9.269	800.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****